

REMARKS

By the present amendment, claims 1, 3, 6-8 and 10-15 have been amended to obviate the examiner's objections thereto and/or to further clarify the concepts of the present invention. Entry of these amendments is respectfully requested.

In the Office Action, claims 1 through 20 were rejected under the first paragraph of 35 USC § 112 as being based on an insufficient disclosure, that is, failing to enable one of ordinary skill to practice the invention. Specifically, it was asserted that the specification does not sufficiently teach how the strips are affixed by being "rolled." Reconsideration of this rejection in view of the above claim amendments and the following comments is respectfully requested.

As to the assertions made, the basis for the rejection is not entirely understood. It is submitted that the disclosure at lines 5-13 of page six and at lines 24-25 of page eleven of the subject specification make it clear in terms of what is involved in the rolling process for joining the strips. Thus, the attention of the examiner is directed to these specific portions of the specification in response to this rejection.

Furthermore, "rolling" is defined by the McGraw-Hill Dictionary of Scientific and Technical Terms as "reducing or changing the cross-sectional area of a workpiece by the compressive force exerted by rotating rolls." Thus, it is submitted that the subject "rolling" is so well known that there is no necessity to describe the procedure in detail nor the manners in which it is conducted. That is,

details of these processes are common knowledge in the art to which the present invention pertains. Further, it is submitted that the patent laws are clear that disclosure requirement may be satisfied by broad disclosure when the subject matter is apparent to one of skill in the art. Accordingly, withdrawal of the rejection under the first paragraph of 35 U.S.C. § 112 is respectfully requested.

Claims 1 through 20 were rejected under the second paragraph of 35 USC § 112 as being indefinite. Reconsideration of this rejection in view of the above claim amendments and the following comments is respectfully requested.

As to the first portion of the rejection regarding the claims being indefinite, it is submitted that the above response to the previous rejection is sufficient. As to the latter portion, claim 1 has been amended to address to clarify the noted language. Thus, it is submitted that the amended claims are in full conformance with the provisions of the cited statute. Accordingly, withdrawal of the rejection under the second paragraph of 35 U.S.C. § 112 is respectfully requested.

Claims 1-3 were rejected under 35 USC § 102(b) as being anticipated by the patent to McKim et al. In making this rejection, it was asserted that the McKim et al patent teaches the entire structure as set forth in the noted claims. Reconsideration of this rejection in view of the above claim amendments and the following comments is respectfully requested.

From a careful review of the McKim et al patent, it is submitted that the characterization of its teachings in the rejection is not be entirely accurate for at least two reasons. First, the McKim

et al patent teaches a current shunt which, as shown in Figure 6c as cited, has contact pins fusion welded to the conductive sheet. Thus, the shunt of the patent does not include electrodes comprised by metal strips as presently claimed, but rather utilizes contact pins.

Second, the McKim et al patent teaches using fusion welding to weld the contact pins. It is submitted that this method differs from the rolling and thermal diffusion method as claimed. The "fusion welded" is a kind of welding which belongs to a prior art technology different from "rolling and thermal diffusion bonding" of the present invention.

In addition to the above, the McKim et al patent does not disclose a trimming without forming any cutout, which causes a detour of the current.

Thus, in summary, the McKim et al patent does not teach electrodes comprised by metal strips which are affixed on the resistor body by means of rolling and thermal diffusion bonding, that is, a combination of rolling and thermal diffusion bonding. Also, the cited patent does not teach trimming by removing a portion of the resistor body without forming any cutout as is claimed.

For the reasons stated above, withdrawal of the rejection under 35 U.S.C. § 102(b) and allowance of claims 1 through 3 over the cited patent are respectfully requested.

Claims 1-2, 4, 6-11, 13, 15-17 and 19-20 were rejected under 35 USC § 102(e) as being anticipated by the '234 patent to Szwarc et al, or alternatively, under 35 USC § 103(a) as being

unpatentable over the same patent to Szwarc et al in view of the patents McKim et al, Hollander or Das et al (hereinafter the "secondary patents"). In making these rejections, it was asserted that either the Szwarc et al patent teaches the entire structure as claimed with the possible exception of the thermal diffusion bonding relative to claims 1 and 6, but alternatively, that the secondary patents teach such diffusion bonding. Further, it was alleged that the Szwarc et al patent teaches an encapsulant for the disclosed resistor relative to the subject matter of independent claim 13. Reconsideration of these rejections in view of the above claim amendments and the following comments is respectfully requested.

It is submitted that presently claimed invention is not taught or suggested by the Szwarc et al patent and the secondary patents whether taken singly or in combination. More particularly, the Szwarc et al patent discloses at column 2, lines 29-33 that resistor 10 is formed by welding strips 14 on each side of resistive strip 12. Thus, the Szwarc et al patent fails to teach or suggest rolling and thermal diffusion bonding. Further, the patent teaches that trimming is carried out by forming a cutout as shown in Fig. 1 and Fig. 2 thereof. Therefore, trimming without forming any cutout as previously claimed is not disclosed in the Szwarc et al patent.

It is submitted that the above noted teaching deficiencies of the Szwarc et al patent are not supplied by the cited secondary patents. Specifically, the secondary patents to Hollander and Das et al patents do not disclose the rolling and thermal diffusion bonding, thus it is difficult to replace the bonding method disclosed in the Szwarc et al patent by the teachings of the secondary patents. For example, the Hollander patent teaches that the edges may be formed by any convenient welding

means using heat such as gas, arc, tig, or resistance welding, or by cold-joining methods such as vacuum-welding or diffusion-bonding without vacuum (column 3, lines 22-25). The Das et al patent at best utilizes the phrase "diffusion bonding" at column 8, line 60. Additionally, the Szwarc et al patent does not disclose any encapsulant.

Furthermore, it is submitted that one of ordinary skill would not utilize the teachings of the secondary patents in combination with the teachings of the Szwarc et al patent. As is well settled, obviousness under Section 103 of the statute requires a suggestion in the art to modify the patent as proposed by the examiner with the expectation that the results achieved would have been predicted by that person of ordinary skill. Thus, one of ordinary skill in the art would not include this procedure in teachings of the Szwarc et al patent.

For the reasons stated above, withdrawal of the rejection under 35 U.S.C. § 103 and allowance of claims 1-2, 4, 6-11, 13, 15-17 and 19-20 as amended over the cited patents are respectfully requested.

Claims 1-17 and 19-20 were rejected under 35 USC § 102(b) as being anticipated by the '085 patent to Szwarc et al, or alternatively, under 35 USC § 103(a) as being unpatentable over the same patent to Szwarc et al in view of the patents McKim et al, Hollander or Das et al. In addition, claims 1-6, 8-9 and 12-180 were rejected under 35 USC § 102(e) as being anticipated by the patent to Gerber et al, or alternatively, under 35 USC § 103(a) as being unpatentable over the same patent to Gerber et al in view of the patents McKim et al, Hollander or Das et al. In making these rejections,

essentially same reasons as set forth previously with regard to the application of the other Szwarc et al patent and the same secondary patents were asserted. Both the '085 Szwarc et al and Gerber et al patents were alleged to teach welding of strip electrodes to the resistor body. Reconsideration of these rejections in view of the above claim amendments and the following comments is respectfully requested.

In view of the similarities of the above two rejections to the immediately prior rejection, it submitted that many of the same considerations as were set forth above with respect to the rejections over the '234 Szwarc et al patent also apply to these particular rejections.

As to the cited Gerber et al patent, it is taught that terminal pads 14, 16 are metallurgically bonded on the resistive material 20 as is set forth in column 3, line 3. Trimming is carried out by forming a cutout as shown, for example, in Fig. 13. Thus, the Gerber et al patent does not teach electrodes comprised by metal strips which are affixed on the resistor body by a combination of rolling and thermal diffusion bonding. Also, the cited patent does not teach trimming by removing a portion of the resistor body without forming any cutout as is previously claimed.

For the reasons stated above, withdrawal of the rejection under 35 U.S.C. § 103 and allowance of claims 1-17 and 19-20 as amended over the cited patents are respectfully requested.

In view of the foregoing, it is submitted that the subject application is now in condition for allowance and early notice to that effect is earnestly solicited.

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In the event this paper is not timely filed, the undersigned hereby petitions for an appropriate extension of time. The fee for this extension may be charged to Deposit Account No. 01-2340, along with any other additional fees which may be required with respect to this paper.

Respectfully submitted,

ARMSTRONG, WESTERMAN & HATTORI, LLP

A handwritten signature in black ink, appearing to read "Donald W. Hanson", written in a cursive style.

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Marked Up Version of Amendments to Specification and Claims

1. (Amended) A low resistance value resistor comprising:
a resistor body comprised by a resistive alloy;
at least two electrodes, comprised by metal strips having a high electrical conductivity,
formed separately on one surface of the resistor body; wherein
the metal strips are affixed on the resistor body by means of at least one if rolling and/or and
thermal diffusion bonding.

3. (Amended) A low resistance value resistor according to claim 1, wherein a portion of the
resistor body is trimmed by removing a portion of the body material along a direction of current flow
between the electrodes to adjust a resistance value without forming any cutout.

6. (Amended) A low resistance value resistor according to claim 1, comprising:
~~—— a resistor body comprised by a plate shaped resistive alloy;~~
~~—— at least two electrodes, comprised by metal strips having a high electrical conductivity;~~
~~affixed to the resistor body by means of rolling and/or thermal diffusion bonding; wherein a~~
thickness of the electrode is not less than a 1/10 fraction of a thickness of the resistor body.

7. (Amended) A low resistance value resistor according to claim 1 6, wherein said two
electrodes are disposed at both ends of a first surface of the resistor body, and two second electrodes
are disposed at both ends of a surface opposite to the first surface having the electrodes.

8. (Amended) A low resistance value resistor according to claim 7 6, wherein a fused solder layer is disposed on each electrode surface.

10. (Amended) A low resistance value resistor according to claim 7 6, wherein a resistivity of the electrode comprised by the high electrical conductivity metal strip is not less than a 1/150 fraction and not more than a 1/2 fraction of a resistivity of the resistor body.

11. (Amended) A low resistance value resistor according to claim 1 6, wherein a material of the resistor body comprises one of: copper-nickel alloy, nickel-chromium alloy, iron-chromium alloy, manganese-copper-nickel alloy, platinum-palladium-silver alloy, gold-silver alloy, and gold-platinum-silver alloy.

12. (Amended) A low resistance value resistor according to claim 7 6, wherein said resistor body is trimmed to adjust a resistance value by removing a portion thereof along a direction of current flow between the electrodes without forming any cutout.

13. (Amended) A low resistance value resistor comprising:
a resistor body comprised by a plate shaped resistive alloy; and
at least two electrodes, comprised by metal strips having high electrical conductivity, formed separately on one surface of the resistor body; and
wherein a portion of the resistor body is trimmed by removing a portion of the body material along a direction of current flow between the electrodes to adjust a resistance value without forming

any cutout

~~an insulation layer for covering a portion of said surface between said electrodes.~~

14. (Amended) A low resistance value resistor according to claim 13, comprising wherein
~~said resistor body is trimmed to adjust a resistance value by removing a portion thereof along a~~
~~direction of current flow between the electrodes~~ an insulation layer which covers a portion of said
surface between said electrodes.

15. (Amended) A low resistance value resistor according to claim 14 ~~13~~, wherein ~~an~~ another
insulation layer is further provided for covering another surface opposite to the surface ~~having the~~
~~electrodes~~ thereof.